

APPENDIX A: RESIDENTIAL AND COMMERCIAL USER'S GUIDE

This appendix looks at what individual residents and businesses can do to help the County reach its community-wide greenhouse gas (GHG) reduction goal. Because GHG emissions are a global pollutant it is vital that individuals look at their own actions and what they can do to conserve energy and reduce carbon emissions. This guide will provide information about local programs and resources that will help residents take the actions described in this Climate Action Plan. It is important to note that the information provided relates to current programs that may change or end before the Climate Action Plan is revised and therefore it is important to check these and other resources for changes and updates to programs. This list also serves as a starting point for sustainable action; there are many more organizations and programs that are working to assist residents and businesses to combat climate change than can fit in these pages.

Water

According to the San Diego County Water Authority's 2009 annual report only 18% of the water they supply to San Diego is from local sources; this means much of the water we consume has to be pumped great distances. Pumping uses a lot of electricity, which generates numerous GHG emissions. By conserving water around your home and business you are not only helping to conserve our limited resource and reduce your water bill, you are also helping to save electricity and reduce carbon emissions.

Resources & Programs

San Diego County Water Authority (SDCWA): As the regional wholesaler of water in San Diego County, SDCWA helps member water agencies promote water conservation by providing rebates for clothes washers, rotating spray nozzles, and smart irrigation controllers.

Your Local Water District: There are many water districts in the unincorporated areas of San Diego County. These utilities not only supply your water, they also supply you with ideas, incentives and assistance to reduce your water consumption. One example of an available resource is the free "Smart Landscape Evaluations" provided by the Lakeside Water District. To find your water district go to the SDCWA website listed below, and select the "Your Local Water District" option. This is the first step in identifying what actions you can take to reduce your water usage and costs.

CAP Measure	Program & Resource	
The San Diego County Water Authority (SDCWA)		
W1	Web Site:	www.20gallonchallenge.com
	Phone:	(858) 522-6600
Your Local Water District		
W1	Web Site:	www.sdcwa.org/member-agencies

Did You Know?

- The average San Diegan used 143 gallons of water a day. It takes 1.3 kilowatt hours (kWh) of electricity to transport, treat, and distribute that water – the same amount of energy as leaving 55 standard 23-Watt compact fluorescent lamp bulbs on for an hour.

Energy

Residents and businesses use energy to perform many tasks that are essential to their daily routines. These tasks release GHGs, which contribute to climate change. By increasing the energy efficiency of these activities home and business owners can reduce utility bills while making San Diego County a cleaner, more energy-independent place.

Resources & Programs

San Diego Gas & Electric (SDG&E): As the provider of both electricity and natural gas in San Diego County, SDG&E has many programs to assist residents and business in saving energy. Below are a few of the most popular efficiency programs but for a full list, visit the SDG&E website or call the Energy Information Center (EIC).

Contact information:
1-800-644-6133 (EIC)
www.SDGE.com

Residential Programs

Participation in energy-reduction programs can result in cost savings. The programs described below enable residents to more effectively monitor energy consumption and receive rebates for upgrading to energy-efficient products.

Evaluate and Monitor Energy Usage: The first step to reducing your energy consumption is to know how you consume it. SDG&E provides tools like the free *Home Energy and Water Efficiency Survey*, which evaluates how you use energy and provides a personalized list of detailed next steps you can take to reduce your energy usage. You can also use your new Smart Meter to access hourly electricity use data through the *Energy Charts* online program. By reviewing your energy usage per hour instead of per month, consistent energy use spikes can be identified and behaviors associated with those spikes can be modified to be more efficient. You will also be able to look at your energy use in relation to the local weather conditions and how your energy use compares to your neighbors.

CAP Measure	Program & Resource	
Home Energy Efficiency Survey		
E1-E3	Web Site:	https://energyaudit-sdge.sempra.com
Energy Charts		
E4	Three easy steps to view your data:	<div>1) Log on to your “My Account” at: https://myaccount.sdge.com</div> <div>2) - Select the “My Energy” tab</div> <div>3) - Click on “View Energy Use Charts”</div>

Rebate Programs: Once you know how you use energy and what you can do to reduce your energy consumption, SDG&E offers incentives and rebates to help you take action.

SDG&E provides mail-in rebates for the following energy-efficient products: refrigerators, pool pumps, window air conditioning units, attic and wall insulation, clothes washers, whole house fans, and dishwashers. Some retailers also provide these instantly at the point of purchase; to view a complete list of participating retailers, visit the website listed below.

Your home works as a system with different parts interacting and working together or working against each other to provide you a comfortable home. These interactions make it important to look at all parts of your home when making improvements. For example, if you purchase a new high-efficiency heater but your air ducts are old, leaky, or disconnected, you will continue to waste energy by heating your attic and not your living space. To promote more holistic energy improvements, the State of California is working with SDG&E, the California Center for Sustainable Energy (CCSE), and local contractors to provide incentives of up to \$4,000 to diagnose and fix inefficient aspects of your home. There are also financing options available to help assist homeowners overcome the upfront costs of making multiple improvements at once.

CAP Measure	Program & Resource	
Home Energy-Efficiency Rebates		
E2.1-E3	Web Site:	www.sdge.com/residential/singleFamilyRebate.shtml
Energy Upgrade California		
E2.1-E3	Web Site:	www.energyupgradeca.org

Saving in the Summer: Cooling homes in the summer can drive up electricity bills and stress the electricity grid. To alleviate the system during peak-demand periods, SDG&E has created two programs to reduce energy consumption during hot periods.

Just like your car, if your air-conditioning system (AC) isn't running at peak performance, it could increase operating costs by using more energy because of inefficient systems. A poorly-tuned system also causes irregular wear on system components. Even new systems set-up incorrectly will run below peak performance. The AC TIME Program offers two **free** services, Refrigerant Charge & Airflow Test and Duct Test & Seal, to improve the energy efficiency level of your AC system.

Another way to reduce your energy consumption and help alleviate strain on the electrical grid is to simply turn off your AC system when the grid is close to capacity. SDG&E has created the Summer Saver program to assist residents in conserving energy during these short peak events. Once you sign up for the program a technician will install a small Summer Saver device on your AC unit. This device is activated remotely by a paging signal that lets SDG&E cycle your central air conditioner "on and off" for a few hours on a limited number of summer days when demand for electricity is at a peak. This helps maintain electric reliability during periods of high demand. In return, SDG&E will **give you an annual credit of up to \$194 on your SDG&E bill.**

CAP Measure		Program & Resource	
AC TIME Program			
E2.1	Web Site:	www.actimeprogram.com	
	Phone:	1-800-289-2440	
Summer Saver Program			
	Web Site:	www.sdge.com/vendor/summersaver	
	Phone:	1-800-850-1705	

Business Programs

County businesses that save energy will not only help mitigate climate change but can also increase profits. SDG&E has several energy efficiency programs targeted at helping businesses become more energy efficient and profitable.

Rebates and Incentives: Just as SDG&E offers residential customers rebates for purchasing qualified energy-efficient products, they also offer businesses rebates and incentives for purchasing energy-efficient equipment. The *Energy Efficiency Business Rebate* program provides traditional product rebates, like the residential rebates, that businesses can qualify for through the replacement of old, inefficient equipment with new energy-efficient equipment. This program focuses on more common equipment that exists in many businesses and has a proven history of saving energy. For a full list of qualifying products please see the rebate catalog on the SDG&E program website or call the EIC.

Because there are so many different types of businesses and they all use energy in different ways, SDG&E has created the *Energy Efficiency Business Incentive* and *Energy Savings Bid* programs to be more flexible and allow businesses to customize energy efficiency improvements to their unique situation. Unlike the rebate program, these programs provide businesses a set amount of cash back per kWh or therm that they save. This is similar to the *Savings By Design* and *Sustainable Communities* programs that aim to increase energy efficiency in new construction. Together, these programs can help you replace your old equipment with new energy-efficiency equipment and increase your profits.

Financing: Even after rebates and incentives many of the energy efficiency improvements require high up-front cost and provide low but long term savings. To help businesses, SDG&E has created *On-Bill Financing*, a **zero percent interest financing** program. To qualify, businesses must have an active SDG&E account, be in good standing for at least two years with the same business, and participate in one of the SDG&E Energy Efficiency programs. Because some on site pre-inspection may be required, it is important to let SDG&E and your contractor know that you would like to participate in the financing program before initiating a project. Once the improvements have been made, you will be charged for the loan on your SDG&E bill. In many cases, because of the quantity of energy savings, even after the addition of the loan payment, the SDG&E bill will still be lower than before the improvements were made. This program allows businesses to save money while modernizing their equipment.

Direct Install: Even with these great programs some small business owners simply do not have time to evaluate their business energy usage and make the needed changes. For those busy businesses with limited resources SDG&E has created the *Direct Install* program, which will perform a no-cost energy audit of the business and provide individual analysis of the findings and work to make recommended improvements. Because this service is offered to many different businesses, it is focused on common improvements for various business sectors throughout the County, such as improving efficiency of incandescent or florescent lights and proper maintenance of HVAC systems. For a full list of qualifying free improvements, visit the program website or call a participating contractor.

CAP Measure	Program & Resource	
Energy Efficiency Business Rebate		
E2.2	Web Site:	www.sdge.com/business/rebatesincentives/programs/energyEfficiency.shtml
Energy Efficiency Business Incentive		
E2.2	Web Site:	www.sdge.com/business/rebatesincentives/programs/standardPerformanceContract.shtml
On Bill Financing		
E2.2	Web Site:	www.sdge.com/business/rebatesincentives/programs/onbillfinancing.shtml
Direct Install		
E2.2	Web Site:	www.sdge.com/business/rebatesincentives/programs/directinstall.shtml

California Center for Sustainability (CCSE): CCSE is a non-profit organization dedicated to creating change for a clean energy future. They offer free workshops, administer incentive programs, host special events, and offer technical assistance.

Contact information:

858-244-1177

www.energycenter.org

California Solar Initiative: The California Solar Initiative (CSI) is the California solar rebate program for customers of the investor-owned utilities – Pacific Gas and Electric, Southern California Edison, and SDG&E. Through the CSI, the California Public Utilities Commission is providing \$2.1 billion to businesses, nonprofit organizations, public agencies and homeowners to help lower their energy costs, reduce their reliance on fossil fuel-fed power plants, and create a sustainable energy future through the use of solar technology. CCSE administers the CSI program in the SDG&E service territory. You can go online, call them, or attend one of their free workshops to find out how you can put solar on your roof and become more energy independent.

California Solar Initiative – Thermal Program: Solar water heating (SWH) systems reduce GHG emissions and conserve fossil fuel resources while cutting energy use and saving money on utility bills. Systems can offset up to 75% of the natural gas, electricity, or propane used by your current water heater. SWH systems work to supplement the existing water heater – you do not need to replace or remove it. The CSI-Thermal Program offers cash rebates of up to \$1,875 for solar water heating systems on single-family homes. Multifamily and Commercial properties qualify for rebates of up to \$500,000.

CAP Measure	Program & Resource	
California Solar Initiative – Thermal Program		
R.1	Web Site:	www.energycenter.org/swh
California Solar Initiative		
R.2	Web Site:	https://energycenter.org/index.php/incentive-programs/california-solar-initiative or www.gosolarcalifornia.org

Transportation

Transportation is the largest emission sector in the County's baseline GHG emissions inventory and represents an essential part of many residents' daily lives. While the majority of transportation needs in the County are met using single-occupancy vehicles, other options exist that result in fewer GHG emissions. These options include ridesharing, biking, walking, using transit, and telecommuting. There are also efforts underway toward changing the efficiency (miles per gallon [MPG]) of vehicles and the carbon intensity of fuel used in the vehicles. Some examples of these efforts include converting to electric (or hybrid), natural gas, or biofuel-powered vehicles. It is a goal of this CAP to expand these alternative transportation strategies for the creation of a more sustainable and connected community in the County.

Resources & Programs

San Diego Association of Governments (SANDAG): As the regional transportation planning agency, SANDAG secures millions of dollars each year in local, state, and federal funds for the region's transportation network. SANDAG develops the Regional Transportation Plan to implement a long-range vision for buses, the Trolley, rail, highways, major streets, bicycle travel, walking, goods movement, and airport services. They are a resource for information and incentives to change how you can get around.

iCommute: This program offers resources for employees and employers participate in alternative commuting programs. Through the iCommute program SANDAG offers free carpool and ridematching services, a subsidized vanpool program, transit solutions, regional support for bicycling, the Guaranteed Ride Home program, SchoolPool carpooling programs for parents, and information about teleworking.

CAP Measure	Program & Resource	
	iCommute	
T1-3	Web Site:	www.icommutesd.com
	Phone:	call 511 and say "iCommute"

California Center for Sustainability (CCSE): In addition to administering the CSI, CCSE also administers incentives for the Clean Vehicle Rebate Project with funding provided by the California Environmental Protection Agency's Air Resources Board. This program offers rebates for individuals and business owners who purchase or lease new eligible zero-emission or plug-in hybrid electric vehicles. CCSE also hosts regional events, workshops and training to help residents discover how many alternative transportation options there are and how they can best take advantage of them.

CAP Measure	Program & Resource	
	Clean Vehicle Rebate Project	
T.4	Web Site:	www.energycenter.org/index.php/incentive-programs/clean-vehicle-rebate-project

Landscaping and Open Space

Planting trees in your yard or in public spaces can help improve the air and water quality in your neighborhood as well as provide habitat for wildlife, reduce the urban heat island effect and, if planted near your home, trees can help keep your home cool in the summer and reduce energy consumption.

By following these helpful tips when planting you can maximize energy savings from your new tree.

- Design an overall shade tree plan, including energy savers such as planting for shading windows, doors, air conditioners, patios, and driveways.
- Plant **only** deciduous trees (not evergreen trees) on the south sides of building. This allows the sun to warm your home during winter months.
- Plant evergreen or deciduous trees on the east and west sides of your home to produce shade that minimizes the impact of the summer sun.
- Always consider the existing landscaping when planting a tree but if possible, plant small trees 10 to 15 feet from buildings, medium trees within 30 feet, and large trees within 40 feet of buildings.

Resources & Programs

The California Center for Sustainable Energy - Advice and Technical Assistance Center (ATAC) for Urban Forestry: ATAC's primary goal is to enable and facilitate a wide range of urban forestry projects in the San Diego region. ATAC is the central meeting place for people interested in learning the how-to and best practices of urban landscaping. Through education, outreach and technical assistance, ATAC provides metrics for use by decision-makers and citizens alike when reaching to meet pressing water conservation and greenhouse gas emissions reduction goals

The Water Conservation Garden at Cuyamaca College: This learning garden offers an opportunity to see trees best suited for the San Diego climate as well as learn about other parts of a sustainable yard, through free educational classes on topics like composting and irrigation.

CAP Measure	Program & Resource	
CCSE Advice and Technical Assistance Center (ATAC) for Urban Forestry		
LS1	Web Site:	www.energycenter.org/index.php/outreach-a-education/advice-and-technical-assistance-center or www.energycenter.org
	Phone:	(858) 244-1177
The Water Conservation Garden at Cuyamaca College		
LS1	Web Site:	www.thegarden.org
	Phone:	(619) 660-0614

APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY AND FORECASTS

This appendix summarizes the methodologies and assumptions that were used to create the greenhouse gas (GHG) emissions inventory and forecasts.

Introduction

The purpose of a GHG emissions inventory is to identify sources and levels of GHG emissions to enable policy makers to implement GHG reduction strategies in policy areas over which they have operational or discretionary control.

Reporting GHG inventories on a calendar year basis is considered standard internationally; the United Nations Framework Convention on Climate Change, the Kyoto Protocol, the European Union Emission Trading System, the Climate Registry, the California Climate Action Registry (CCAR), and the state's mandatory reporting regulation under Assembly Bill 32 all require GHG inventories to be tracked and reported on a calendar-year basis. A community-wide GHG emissions inventory was created for the 2005 "baseline" year for the County of San Diego (County) and a local government GHG emissions inventory was created for the 2006 baseline year for the County's local government operations. The difference in baseline years was due to data availability.

The community-wide inventory was completed for the following sectors: transportation, energy (electricity and natural gas), solid waste, wastewater, potable water, agriculture, and other. Government emissions are generally considered a subset of the community emissions.

Forecast GHG emissions were estimated for 2020, 2035, and 2050 for both community and local government emissions under a business-as-usual (BAU) scenario. A BAU scenario is the expected emissions that would occur if the CAP and other GHG-reducing measures (such as statewide legislation) were not implemented.

The state of the art in preparing GHG inventories and forecasts is evolving rapidly. During the preparation of the County's General Plan, the University of San Diego's Energy Policy Initiatives Center (EPIC) calculated GHG emissions for the County for both community-wide sectors and County government operations for the years 1990 and 2006, with emissions projections for 2020. Since the completion of the EPIC inventory, methodologies for conducting an emissions inventory have been refined to provide consistency among communities and municipalities. Currently, ARB has adopted a methodology only for local government operations, called the Local Government Operations Protocol (LGOP), although there are some methodologies that apply equally to community inventories. In addition, there are best-practices for community inventory methodology, including from the Intergovernmental Panel on Climate Change (IPCC). While these provide a much more accurate inventory, they also require substantial input data, often preventing a 1990 inventory that meets the LGOP standards. In order to adhere to the adopted LGOP and to provide a more accurate estimate of the community-wide GHG emissions to be used in a CAP, the County updated the existing inventories. Consequently, 1990 inventories were not possible but the baseline years were updated (2006 for government operations, 2005 for community-wide). A summary of the baseline and forecast community-wide and local government GHG emissions and forecasts are provided below.

Table B.1 | County of San Diego GHG Baseline and Projected Emissions

Sector	2005 Baseline	2020 BAU	2035 BAU	2050 BAU
	(MT CO ₂ e)			
Transportation	2,636,702	3,098,307	4,004,966	4,785,555
Residential Energy	505,963	566,033	666,952	707,334
Commercial/Industrial Energy	615,687	737,916	818,698	934,503
Agriculture	190,025	159,246	118,134	83,520
Solid Waste	144,865	162,064	190,959	202,521
Wastewater	50,412	56,397	66,452	70,475
Potable Water	236,435	264,506	311,665	330,535
Other	132,490	148,220	174,646	185,221
Total	4,512,580	5,192,689	6,352,472	7,299,664
GHG Emissions per service population ¹	7.47	7.48	7.80	8.23
GHG Emissions per population	9.57	9.52	9.83	10.51

¹Service population refers to the residents and employees in the County as estimated by SANDAG

Table B.2 | County of San Diego Government GHG Baseline and Projected Emissions

County Government GHG Baseline and Projected Emissions				
Sector	2006	2020	2035	2050
	(MT CO ₂ e)			
Solid Waste Facilities	64,192	48,516	35,943	26,627
Employee Commute	57,572	63,017	70,776	73,893
Buildings and Facilities	55,291	61,420	67,987	75,256
Vehicle Fleet	23,231	24,960	27,428	28,611
Wastewater Facilities	11,656	13,451	16,232	17,661
Government-Generated Solid Waste	4,892	5,256	5,776	6,025
Public Lighting	2,160	2,493	3,008	3,273
Airport Facilities	1,153	1,331	1,606	1,747
Water	488	524	576	601
Total	220,633	220,968	229,331	233,695

Transportation

The transportation sector includes the operation of on-road vehicles. Emissions from mobile combustion can be estimated based on vehicle fuel use and miles traveled data. CO₂ emissions, which account for the majority of emissions from mobile sources, are directly related to the quantity of fuel combusted and, thus, can be calculated using fuel consumption data. CH₄ and N₂O emissions depend more on the emissions-control technologies employed in the vehicle and the distance traveled. Calculating emissions of CH₄ and N₂O requires data on vehicle characteristics (which takes into account emissions-control technologies) and vehicle miles traveled (VMT).

Community-wide VMT for 2005, 2020, 2035, and 2050 were provided by the traffic consultant Fehr & Peers. Fehr & Peers used the San Diego Association of Governments (SANDAG) travel demand model and adjusted outputs to include travel only within the unincorporated portions of the County and to exclude VMT associated with roadways in the Camp Pendleton area which located in the boundary of the County but not within the jurisdiction of the County. The County has no land use authority over the activities at Camp Pendleton and therefore cannot affect VMT associated with roadways within the boundary of the facility.

Employee commute VMT were estimated using the average commute distance for County residents, as provided in the County's General Plan Environmental Impact Report, and the number of full time equivalent employees in 2006. Forecasts of the number of employees for 2020 and 2035 were estimated assuming a change in employees equal to one-half the growth rate of the County residential population.

Emissions factors for the transportation sector were obtained using the California Air Resources Board (ARB) vehicle emissions model, EMFAC. EMFAC is a mobile-source emissions model for California that provides vehicle emissions factors by county and vehicle class. For the emissions inventory, San Diego County emissions factors were used for 2005 (community), 2006 (County government), 2020, and 2035. EMFAC does not project vehicle emissions factors beyond 2040; therefore, 2040 was used to estimate emissions in 2050. Pursuant to U.S. Environmental Protection Agency (EPA) guidance, CO_{2e} emissions were calculated by dividing CO₂ emissions by 0.95, which accounts for other GHGs such as N₂O, CH₄, and other high global warming potential (GWP) gases.

Energy

The energy consumption sector includes the use of electricity and natural gas (subsectors) in residential, commercial, and industrial land uses within the legal boundaries of the County. Electricity-related GHG emissions are considered indirect emissions. Indirect emissions are those that are generated as a result of activities occurring within the jurisdiction, but occur in different geographic areas. Although emissions associated with electricity production are likely to occur in a different jurisdiction, consumers are considered accountable for the generation of those emissions. For example, a resident may consume electricity within the County, but the electricity may be generated in a different region. Direct emissions occur from activities that directly generate the emissions (e.g., natural gas combustion for heating or cooling). San Diego Gas & Electric (SDG&E) provided electricity consumption data in kilowatt-hours per year (kWh/yr) natural gas consumption data in therms per year (therms/yr).

Electricity-related GHG emissions were quantified using an SDG&E-specific emissions factor for CO₂ emissions from the Climate Registry for 2005 (community) and 2006 (County government), and emission factors for CH₄ and N₂O were obtained from the CCAR protocol, which provides a state-wide average. Emissions factors for CO₂, CH₄, and N₂O for natural gas were obtained from the CCAR protocol.

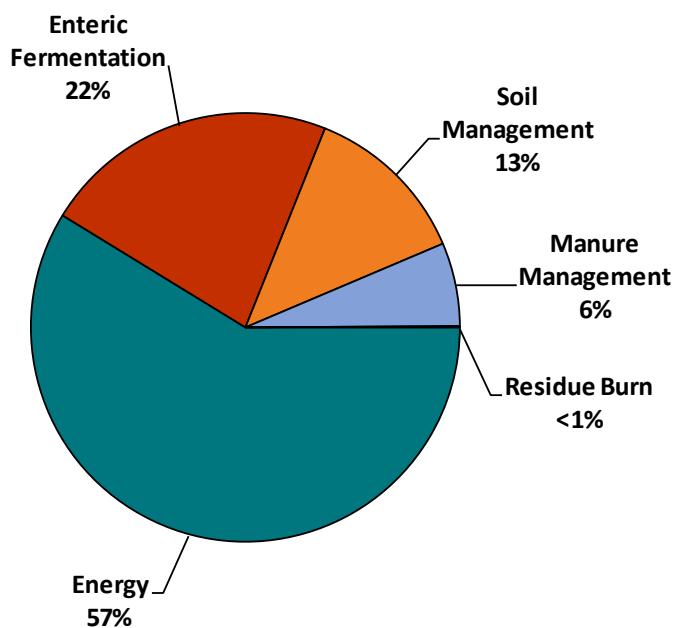
Forecasts of communitywide energy consumption were based on the change in number of households (residential energy) and the change in the commercial/industrial development (commercial/industrial

energy) anticipated by SANDAG for 2020 and 2035 in the County. Forecasts of County government energy consumption were based on the anticipated square footage under County control (buildings and facilities) and estimated County population (public lighting and airport facilities) for 2020 and 2035.

Agriculture

The following agricultural GHG emission sources are recommended by ARB, and used in their annual statewide inventory. Methodologies used for analysis of the Agricultural GHG emissions are those recommended by the California Air Resources Board (ARB) (generally derived from the IPCC), except where noted. In general, a bottom-up approach is applied when possible. Forecasts of agricultural GHG emissions were estimated using SANDAG's forecasted developed acres of agricultural land in 2020 and 2035. Within the agriculture sector, energy emissions (from diesel-operated pumps and off-road vehicles) accounted for the majority (57%) of total emissions. Other agricultural emissions calculated included enteric fermentation (22%), soil management (12%), manure management (9%) and residue burn (less than 1%), and are shown in the figure below.

Figure B.1 | San Diego County Agricultural Emissions (2005)



Energy Emissions

The majority of energy-related agriculture emissions are captured in the electricity/natural gas energy sectors; however, some energy sources, such as those that fuel off-road vehicles and irrigation pumps, are not. ARB uses information from the Energy Information Administration (EIA), for statewide agricultural fuel consumption. County agricultural energy emissions were derived using a bottom-up approach to estimate emissions from vehicles and pumps.

Agricultural Vehicles

Off-road agricultural vehicles such as mowers, sprayers, tractors, balers, and tillers emit CO₂, CH₄, and N₂O. The emissions associated with off-road agricultural vehicles were derived using the modeling software OFFROAD2007. OFFROAD2007 is a software package used to generate emissions inventory data for off-road mobile sources. The software reports monthly or annual emissions for different calendar years, by county, district, air basin, or for the entire state. For the inventory updates, we used San Diego County, 2005. Because most agriculture within the County occurs in the unincorporated areas, 100% of off-road agricultural vehicle emissions were assumed to be derived from the unincorporated County.

Agricultural Pumps

According to ARB, diesel-fueled agricultural irrigation pump engines are a significant source of emissions in California. ARB conducted a statewide inventory for diesel-fueled agricultural irrigation pumps in 2003. From their survey, it was estimated that the County had 178 total irrigation pumps. Emission factors were determined using OFFROAD2007 and assumptions on horsepower ratings, engine efficiency, and hours of engine run-time per year.

Residue Burning

GHG emissions from residue burning are derived from the data and assumptions available from the common practice of burning corn, wheat, barley, walnut, almond, and rice crops after harvest. According to the San Diego 2005 Annual Crop Report, the County only has significant corn and barley crops. We have calculated CO₂, CH₄, and N₂O emissions associated with the burning of these crops, according to ARB methodology. Although CO₂ emissions are biogenic, they are created as a result of a management practice and would not occur naturally. Therefore, they are important to consider in the GHG Emissions Inventory.

Soil Management

Soil management emissions are primarily a result of nitrogen in synthetic fertilizer, but can also come from organic fertilizer, dolomite, lime, and manure. We have calculated emissions associated with synthetic fertilizer, dolomite, and limestone application using the methodology defined by ARB. The lack of reliable information regarding application rates and emission calculation methodology prevented the calculation of emissions from organic fertilizer application and manure (and crop residue).

Enteric Fermentation

Livestock production results in methane (CH₄) emissions from enteric fermentation. Enteric fermentation is a digestive process in ruminant animals, and results in methane emissions through exhalation or belching by the animal. Methane also is produced in the large intestines of ruminants and is expelled. Animals that exhibit enteric fermentation include cattle, sheep, and swine. The ARB methodology was used to calculate enteric fermentation in cattle, sheep, and swine that are present in San Diego County.

Histosol Cultivation and Rice Cultivation

Histosols are defined as having more than 50 percent organic matter in the upper 30 inches of soil, and generally form in wetland areas where plant litter (roots, stems, leaves) accumulates faster than it can fully decompose. The vast majority of histosols within California are found in the Sacramento-San Joaquin Delta, and are not found in significant quantities in San Diego County; therefore, emissions from histosols are considered negligible and are not quantified. Rice is not a commodity of San Diego County, and therefore emissions due to rice cultivation are not applicable.

Manure Management

Livestock production results in CH₄ and N₂O emissions from manure management systems. Methane emissions from manure management tend to be smaller than enteric emissions. Nitrous oxide emissions from manure management vary significantly between the types of management system used and can also result in indirect emissions due to other forms of nitrogen loss from the system. The amount of detail required for N₂O analysis was not available for the County of San Diego, and statewide, N₂O emissions account for less than 15% of total manure management emissions and less than 1% of total statewide emissions. Therefore, N₂O emissions due to manure management were considered negligible for the County.

Solid Waste

GHG emissions attributed to the solid waste sector include emissions from annual solid waste disposal and annual alternative daily cover (i.e., organic material used to cover waste piles, which also decomposes and generates GHG emissions). In addition, the inventory includes waste-in-place emissions associated with existing solid waste decomposition (i.e., anaerobic and aerobic decomposition that primarily produce CH₄ and CO₂ emissions, respectively). Annual GHG emissions associated with year 2005 solid waste disposal and alternative daily cover were calculated using ICLEI's CACP software. The ICLEI CACP software allows the user to enter the amount (i.e., tons) of solid waste and/or alternative daily cover disposed per year and specify waste categorization percentages (e.g., paper products, food waste, plant debris). Solid waste and alternative daily cover disposal data for the unincorporated County in year 2005 were obtained from CalRecycle's database.

Waste-in-place emissions associated with existing solid waste were calculated using methodologies from ARB's Landfill Emissions Tool. This method involves evaluating the portion of waste-in-place that is anaerobically degradable organic carbon (ANDOC) in order to calculate annual CH₄ and CO₂ emissions from waste-in-place. Waste-in-place data for each unincorporated County landfill were obtained from CalRecycle. Waste categorization data for the waste-in-place were obtained from multiple sources (i.e., CalRecycle, EPA, and IPCC) in order to develop a full 1990 to 2005 waste-in-place profile. The waste-in-place profile includes the amount of solid waste disposed each year (i.e., tons) along with the corresponding waste categorization percentages.

Forecasts for solid waste related GHG emissions were estimated using anticipated number of households (community solid waste), number of County government employees (County government generated solid waste), and a natural decay rate of 1.98% per year of closed landfills (solid waste facilities).

Wastewater

Wastewater originates from a variety of sources and is generally treated onsite or through a sewer system to a centralized plant. In San Diego County, there are six facilities that manage wastewater, including Rancho del Campo, Pine Valley, Julian, Heise Park, San Pasqual Academy, and Descanso Detention Facility. For facilities that monitor nitrogen flow, direct, bottom-up emissions may be calculated by facility. For the facilities located in unincorporated County, nitrogen monitoring is not required, and therefore, an alternative approach was necessary. IPCC guidelines suggest a methodology using local population and default values for estimating CH₄ production associated with wastewater treatment; this approach was used. The SANDAG-estimated number of households in the County was used to forecast wastewater-related emissions in 2020, 2035, and 2050.

Potable Water

Potable water is a scarce resource in San Diego County and there are a number of measures that help to conserve water resources. In order to adequately quantify any reductions, GHG emissions related to potable water should be calculated in the baseline inventory. AECOM has obtained the San Diego County Water Authority 2005 Annual Report, which includes water conveyance data for the entire county.

Agricultural water is separated from municipal and industrial water consumption. Water used in agricultural operations was assumed to be 100% within the unincorporated areas of the county. Municipal and industrial water consumption was not separated into city/unincorporated areas; therefore, the unincorporated portion was assumed to be directly proportional to population. While some industrial sources are included within the cities, other major industrial centers are in the unincorporated areas as well, and the proportional assumptions are believed to be reasonable. Forecasts for potable water-related GHG emissions were derived using the estimated number of households in the County (community) and number of employees (County government) in 2020, 2035, and 2050.

Other

Other emission sources in the County include emissions associated with construction, light commercial, industrial, lawn and gardening, and off-road vehicles. Data for community activities were estimated using OFFROAD2007, which provides county-level emissions for off-road equipment.

ARB's OFFROAD2007 model was used to quantify GHG emissions associated with community sources. OFFROAD2007 is an off-road mobile-source emissions model for California that provides emissions by county for equipment such as construction, light commercial, industrial, lawn and garden, and recreational vehicles. Indicators specific to the County were used to allocate county-wide emissions. Statistics from the U.S. Census Bureau and U.S. Department of Housing and Urban Development on households, retail jobs, and manufacturing jobs for construction, lawn and garden, light commercial, and industrial off-road equipment allocation were used. GHG emissions associated with the County's sources were estimated using CO₂ emissions factors for gasoline and diesel from EMFAC, and adjusted to reflect emissions due to CH₄ and N₂O, similar to the methodology described for transportation. Forecasts of these emissions sources were estimated using anticipated changes in County population over time.

APPENDIX C: GREENHOUSE GAS REDUCTION STRATEGIES

This appendix summarizes the assumptions and parameters used to calculate the greenhouse gas (GHG) emission reduction performance of recommended Climate Action Plan (CAP) measures for which a quantified reduction has been calculated. Emission reduction measures are discussed and organized by the emissions sectors that they would affect. Supporting measures that do not have an associated quantification calculation are not included in this section. For all measures, quantification is expressed as metric tons of carbon dioxide equivalent (MT CO₂e) emissions avoided per year, by 2020, and similar methodology was used to estimate 2035 GHG emission reduction potentials. Reduction in GHG emissions associated with the measures was estimated using the 2010 California Air Pollution Control Officers Association (CAPCOA) document, Quantifying Greenhouse Gas Mitigation Measures (CAPCOA Quantification Report), modeling, and expertise.

Figure C.1 | 2020 GHG Reduction Potential by Sector

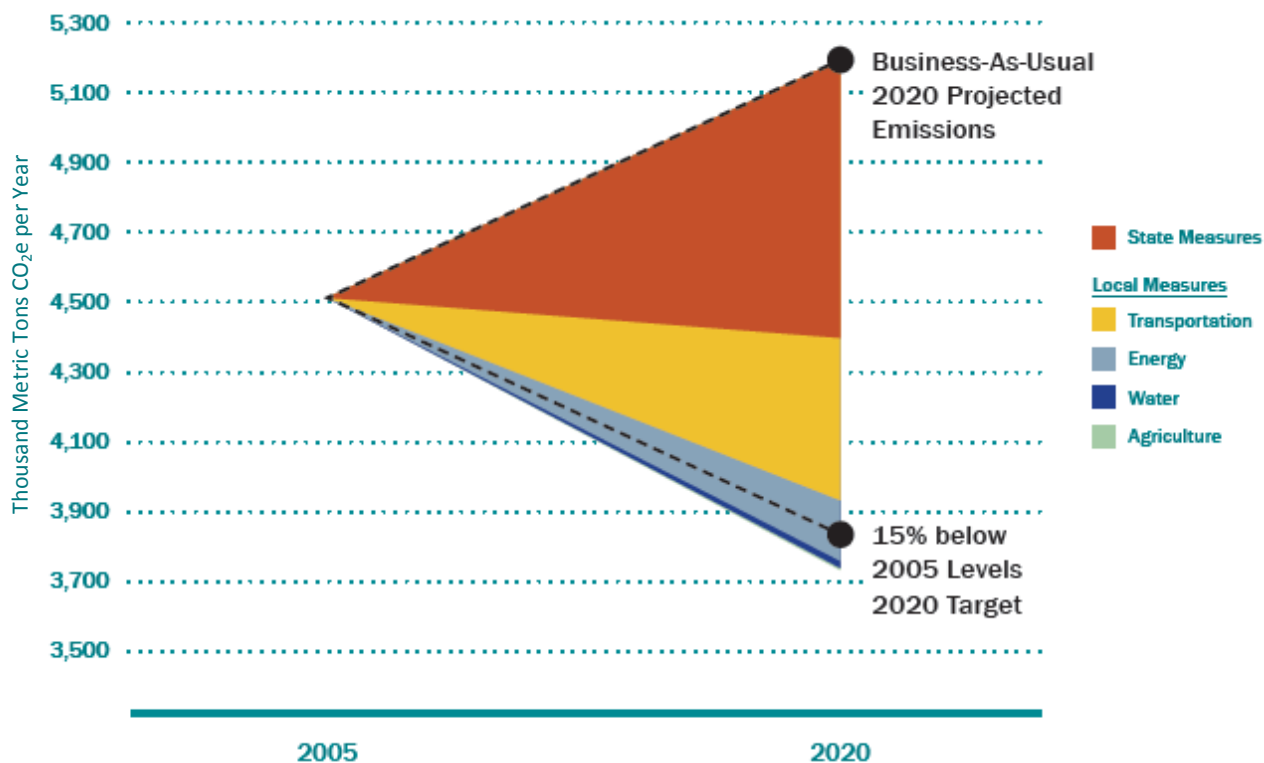


Table C.1 | Summary Table of 2020 GHG Reduction Measures

MEASURE NUMBER	MEASURE	REDUCTIONS MT CO ₂ e/YEAR	Measure Performance
Water			
W1	Conserving Water	20,200	1.4%
Energy			
E1	Energy Efficiency for New	12,997	0.9%
E2.1	Residential Building Retrofits	27,999	1.9%
E2.2	Commercial Building Retrofits	5,257	0.4%
E3	Appliance Upgrade	20,060	1.4%
E4	Smart Meters	8,880	0.6%
R1	Solar Water Heating	37,618	2.6%
R2	Alternative Energy Systems	45,290	3.1%
Land Use			
LU1	Mixed-Use Development	124,180	8.5%
Transportation			
T1	Increase Transit Use	62,090	4.2%
T2	Increase Biking and Walking	93,135	6.4%
T3	Increase Ride Sharing	93,135	6.4%
T4	Electric Vehicles	93,135	6.4%
Agriculture			
A1	Nitrogen Optimization	199	0.0%
A2	Field Equipment Fuel Efficiency	4,433	0.3%
A3	Agriculture Irrigation Pump Efficiency	1,826	0.1%
Landscaping and Open Space			
LS1	Plant Trees	2,475	0.3%
TOTAL COUNTY ACTION		652,909	44%
State and Federal			
SF1	Pavley I & II - Passenger Auto and	416,210	28.4%
SF2	Low Carbon Fuel Standard	175,075	12.0%
SF3	Renewable Portfolio Standard	200,665	13.7%
SF4	T-4 Tire Pressure Program	8,482	0.6%
SF5	T-7 HDV GHG Emission Reduction	9,753	0.7%
TOTAL STATE AND FEDERAL ACTION		810,185	55%
(COUNTY, STATE, AND FEDERAL ACTIONS)		1,463,094	100%
Percent Reduction below 2005 Baseline		17.4%	

Appendix Format

Sector Name

Measure Number - Title (S = Supporting Measure)

Goal (Performance Indicator)

Methodology description

Sectors

Landscaping and Open Space

LS1 - Plant Trees

Plant 10,000 trees throughout the unincorporated area of the County.

Quantification of carbon reductions associated with this measure is based on both the mitigated carbon from energy savings associated with having shade trees near residential and commercial properties as well as the carbon sequestered in the trees themselves. Carbon savings from the reduced energy consumption assumes that planting guidelines, which control the types of trees that are planted and where they are placed around the house, are followed to ensure that the trees reduce the cooling load and electrical usage of the home. Based on these guidelines, it is assumed that the average home will save 1,696 MT CO₂e from energy savings and 779 MT CO₂e through sequestration. Carbon sequestration rates specific to the species and age of the planted trees were used to calculate the annual sequestration potential of the trees from 2010 to 2020.

Participation Rate (number of trees planted)	Efficiency – percent of residential and commercial energy reduction	Efficiency – amount of carbon (MT CO ₂ e/year) sequestered annually	GHG Reduction (MT CO ₂ e/year)	Scaled Measure Performance (% reduction in GHG emissions)
10,000	0.34%	779	2,475	0.3%
Sources: Center for Urban Forest Research Tree Carbon Calculator (US Forest Service and CA Dept of Forestry) http://www.fs.fed.us/ccrc/topics/urban-forests/ctcc/				

Water

W1 - Conserving Water

Reduce per capita water consumption by 20%.

This measure evaluates the energy and emission savings that will come from achieving the 20% reduction in per capita water usage goal of The Water Conservation Act of 2009 (SB7X 7). The energy savings associated with this measure are from the decreased need to pump, treat, and distribute water.

This process is very energy intensive with the typical indoor treated water consuming 13,021 kWh per million gallons to reach County residents.

Participation Rate	Efficiency - Reduction in Per Capita Water Usage	GHG Reduction (MT CO ₂ e/year)	Scaled Measure Performance (% reduction in GHG emissions)
100%	20%	20,200	1.4%

Energy

E1 - Efficiency Requirements for New Development

Encourage new construction to meet voluntary energy efficiency standards that are 15% above 2008 Title 24 standards (will become required in 2015).

This measure focuses on the energy efficiency of new buildings that will be built in the unincorporated County. By encouraging developers and builders to exceed the state Title 24 mandate for energy efficiency by 15% the county will be reducing the annual energy consumption of those building for their operational life. Until this measure becomes mandatory in 2015 it is assumed that 10% of the buildings will meet this higher standard; after 2015 that participation rate is assumed to increase to 100%.

Participation Rate	Efficiency	GHG Reduction (MT CO ₂ e/year)	Scaled Measure Performance (% reduction in GHG emissions)
10% until 2015 100% after 2015	15% above Title 24 standards	Commercial: 5,168 Residential: 7,829	Commercial: 0.5% Residential: 0.4%
Sources: AECOM 2011			

E2.1 - Residential Energy Efficiency Retrofits

Perform energy efficiency retrofits in 15% of existing residential buildings.

Because of the age of the counties building stock and the significant energy savings potential of increasing the efficiency of older homes, only homes older than 2002 were included in the GHG reduction calculations. To quantify energy savings from improving the energy efficiency of existing buildings it was assumed that 15% of residential buildings underwent either a basic energy efficiency improvement which includes insulation installation/upgrade, duct sealing, and AC refrigerant recharge or more advanced energy efficiency improvements such as: HVAC replacement, wall insulation or water heater replacement. While the specific energy savings of each project will vary based on the individual specifications of each home, including age, type, and condition of the building, and the applied measure(s). This measure assumes that, on average, there will be a 35% energy efficiency improvement.

Participation Rate	Efficiency	GHG Reduction (MT CO ₂ e/year)	Scaled Measure Performance (% reduction in GHG emissions)
15%	Savings vary per residential type and building vintage	27,999	1.9%
Sources: AECOM SIME™ Model			

E2.2 - Existing Commercial Buildings

Improve efficiency of lighting in commercial building by 40%

This measure assumes that 30% of commercial units built before 2002 will increase the energy efficiency of their lighting by 40%.

Participation Rate	Efficiency	GHG Reduction (MT CO ₂ e/year)	Scaled Measure Performance (% reduction in GHG emissions)
30%	40%	5,257	0.4%
Sources: CAPCOA Report, Quantifying Greenhouse Gas Mitigation Measures, August 2010.			

E3 - Appliance Upgrade

Replace existing appliances with Energy Star™ qualified appliances in 40% of existing homes and 95% of new homes.

This measure encourages homeowners to replace older appliances such as, refrigerators, dishwashers, clothes washers and light bulbs with newer energy efficient models. It assumes that each house will replace 20 incandescent light bulbs with 20 compact florescent light (CFL) bulbs and one of all other appliance types with a newer energy efficient model; combined, these improvements will save 1,780 kWh annually. The Energy Star appliances modeled and annual energy savings include: refrigerator - 120 kWh, dishwasher - 480 kWh, clothes washer - 540 kWh and light bulbs - 640 kWh. Other Energy Star appliances that can help to meet or exceed this target include: freezers, air purifiers, water coolers, and dehumidifiers.

Participation Rate	Efficiency – average increase in efficiency of new appliances	GHG Reduction (MT CO ₂ e/year)	Scaled Measure Performance (% reduction in GHG emissions)
40% of existing homes 95% of new homes	variable	20,060	1.4%
Sources: CAPCOA Report, Quantifying Greenhouse Gas Mitigation, August 2010			

E4 - Smart Meter

Help County residents conserve energy by utilizing the enhanced features of their new Smart Meter.

It is assumed that with more detailed and relevant information about their electrical consumption, 10% of existing residential and commercial energy users will utilize this new technology to reduce their electricity consumption by 5%; while another 10% of new residential and commercial energy users will be able to further integrate this information in to their homes and reduce their electricity consumption by 6%.

Participation Rate	Efficiency (% of reductions in electrical usage)	GHG Reduction (MT CO ₂ e/year)	Scaled Measure Performance (% reduction in GHG emissions)
10%	5% for users in existing buildings 6% for users in new buildings	8,880	0.6%
Sources: Estimating the Benefits of the GridWise Initiative Phase I Report Walter S. Baer, Brent Fulton, Sergej Mahnovski TR-160-PNNL, May 2004 Prepared for the Pacific Northwest National Laboratory			

R1 - Solar Hot Water Heating

Install solar hot water heating systems on 19% of residential and commercial buildings

This measure assumes that 19% of commercial water heaters will be converted to solar heaters. Looking at the commercial sector in more detail this translates to: 60% of colleges/schools and 10% of retail, office and all other commercial users converting to solar hot water heating. To quantify GHG reductions from this measure it was assumed that by utilizing solar hot water heating the commercial users can reduce their energy consumption for heating water by 59%. For the residential sector it was also assumed that 19% of users would convert to solar hot water heating. Solar hot water heaters better fit the energy use patterns of residential users they would be able to reduce their energy consumption for water heating by 70%.

Participation Rate	Efficiency (% of reductions in energy usage)	GHG Reduction (MT CO ₂ e/year)	Scaled Measure Performance (% reduction in GHG emissions)
19%	59% for commercial users 70% for residential users	37,618	2.6%
Sources: AECOM SSIme™ Building Energy Analysis, 2011			

R2 - Alternative Energy Systems

Install photovoltaic (PV) systems to generate 5% of existing residential electricity and cover 5.5 million square feet of commercial owned property.

To calculate residential savings it was assumed that 5% of electricity in existing homes would be met through PV systems.

For commercial/industrial PV systems, a bottom-up calculation was performed assuming a system efficiency of 10 watts per square foot and solar irradiance of 18 kilowatt-hours per square foot per year (SolarEstimate 2010) (assuming an average of 5 hours of operation per day per year). The 2005 SDG&E emission factor was multiplied by solar irradiance to calculate the reduction potential of the proposed PV systems in units of pounds of CO₂e per square foot PV per year. This reduction potential was then multiplied by the assumed 5,500,000 square feet of panel area to calculate total emission reductions.

Participation Rate	Efficiency	GHG Reduction (MT CO ₂ e/year)	Scaled Measure Performance (% reduction in GHG emissions)
Residential: 5% Commercial: 55 MW (5.5 million sq ft) or 8%	Commercial: 10 watts per sq ft, 5 hrs per day	Residential: 16,821 Commercial: 28,469	Residential: 1.2% Commercial: 1.9%
Sources: Solar Estimate. Energy Matters. Solar and Wind Energy Calculations. Available at: http://www.solarestimate.org/ . Accessed August 2011.			

Land Use

LU1 - Mixed-Use Development

Encourage high density and mixed-use development, especially when located near existing employment areas

This measure aims at reducing the amount of miles that community members must drive to meet the needs of daily living. The expansive nature of the County lends itself to clustering mixed uses together and around existing employment centers to allow residents to perform tasks while reducing the need or distance to drive. These changes to land use patterns are assumed to create a 4% decrease in overall VMT. Because this measure will only change the composition and location of future development and redevelopment, of which no more than 25% is expected to occur in high density areas, the estimated reduction in VMT and emissions come from decreases in new VMT generated by the new developments and redevelopments only.

Participation Rate (% of new development that will occur in high density areas)	Efficiency (% VMT reductions)	GHG Reduction (MT CO ₂ e/year)	Scaled Measure Performance (% reduction in GHG emissions)
25%	4%	124,180	8.2%
<p>Sources: Boarnet, Marlon and Handy, Susan. 2010. "DRAFT Policy Brief on the Impacts of Residential Density Based on a Review of the Empirical Literature." http://arb.ca.gov/cc/sb375/policies/policies.htm; Table 1.</p> <p>TRB, 2009. <i>Driving and the Built Environment</i>, Transportation Research Board Special Report 298. http://onlinepubs.trb.org/Onlinepubs/sr/sr298.pdf . Accessed March 2010. (p. 4)</p> <p>Ewing, R., and Cervero, R., "Travel and the Built Environment - A Meta-Analysis." <i>Journal of the American Planning Association</i>, <to be published> (2010). Table 4.</p> <p>Song, Y., and Knaap, G., "Measuring the effects of mixed land uses on housing values." <i>Regional Science and Urban Economics</i> 34 (2004) 663-680. (p. 669)</p> <p>http://urban.csuohio.edu/~sugie/papers/RSUE/RSUE2005_Measuring%20the%20effects%20of%20mixed%20land%20use.pdf</p> <p>Nelson\Nygaard, 2005. Crediting Low-Traffic Developments (p.12).</p> <p>http://www.montgomeryplanning.org/transportation/documents/TripGenerationAnalysisUsingURBEMIS.pdf</p> <p>Criterion Planner/Engineers and Fehr & Peers Associates (2001). Index 4D Method. <i>A Quick-Response Method of Estimating Travel Impacts from Land-Use Changes</i>. Technical Memorandum prepared for US EPA, October 2001.</p>			

Transportation

T1 - Increase Transit Use

Increase the transit use in transportation mode share

This measure requires the County to increase the number of residents who use transit for their transportation needs. This will be achieved through two strategies: by improving the transit facilities and in promoting the use of the transit network. The estimated VMT reductions from this strategy are derived from estimates of transit service improvement, which range from 1 percent to 8 percent. As this strategy would involve a promotional campaign and improvements to transit facilities, the level of effectiveness was assumed to be result in a 2 percent VMT reduction.

Participation Rate (increased transit ridership)	Efficiency (% VMT reductions)	GHG Reduction (MT CO ₂ e/year)	Scaled Measure Performance (% reduction in GHG emissions)
2%	2%	62,090	4.1%
<p>Sources: Transit Cooperative Research Program. TCRP 27 – Building Transit Ridership: An Exploration of Transit's Market Share and the Public Policies That Influence It (p.47-48). 1997.</p> <p>Ewing, et al, 2008. <i>Growing Cooler – The Evidence on Urban Development and Climate Change</i>. Urban Land Institute</p>			

T2 - Increase Biking and Walking

Increase the pedestrian and bicycle transportation mode share

Quantification of this measure assumes that implementation would result in a 3% mode shift from single-occupancy vehicles to bicycle travel and walking. This will be achieved through three targeted strategies: expanding the pedestrian network, promoting road sharing and developing off-street bicycle facilities. According to the CAPCOA Quantification Report, pedestrian network improvements can yield a VMT reduction of 2%, as these improvements are limited in scale to selected areas of the County; the more limited VMT reduction at 2% was applied to the analysis. Additional research has also shown that adding bicycle facilities can increase the percentage of commuters who travel by bicycle. This increase is generally small (1% or less) and typically occurs with the construction or designation of new bicycle lanes. As such, it was assumed that the emission reduction benefits of this strategy would be a 1% decrease in VMT as this represents the typical experience observed. It was assumed that the County would expand its existing facilities to provide a 50% increase in the number of bicycle and pedestrian facilities.

Participation Rate (% increase of bicycle and pedestrian facilities)	Efficiency (% VMT reductions)	GHG Reduction (MT CO ₂ e/year)	Scaled Measure Performance (% reduction in GHG emissions)
50%	3%	93,135	6.2%
<p>Sources: Center for Clean Air Policy (CCAP) Transportation Emission Guidebook. http://www.ccap.org/safe/guidebook/guide_complete.html 1000 Friends of Oregon (1997) "Making the Connections: A Summary of the LUTRAQ Project" (p. 16). http://www.onethousandfriendsoforegon.org/resources/lut_vol7.html Nelson\Nygaard, 2010. City of Santa Monica Land Use and Circulation Element EIR Report, Appendix – Santa Monica Luce Trip Reduction Impacts Analysis (p.401). http://www.shapethefuture2025.net/ Sacramento Metropolitan Air Quality Management District (SMAQMD) Recommended Guidance for Land Use Emission Reductions. (p. 11) http://www.airquality.org/ceqa/GuidanceLUEmissionReductions.pdf Dill, Jennifer and Theresa Carr (2003). "Bicycle Commuting and Facilities in Major U.S. Cities: If You Build Them, Commuters Will Use Them – Another Look." <i>TRB 2003 Annual Meeting CD-ROM</i>. Cambridge Systematics. <i>Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions</i>. Technical Appendices. Prepared for the Urban Land Institute. http://www.movingcooler.info/Library/Documents/Moving%20Cooler_Appendix%20B_Effectiveness_102209.pdf Nelson, Arthur and David Allen (1997). "If You Build Them, Commuters Will Use Them; Cross-Sectional Analysis of Commuters and Bicycle Facilities." <i>Transportation Research Record</i> 1578.</p>			

T3 - Increase Ride Sharing

Increase the number of employers that allow and offer amenities to encourage alternate commuting strategies that reduce VMT for employee commute.

Travel Demand Management (TDM) includes those measures that are designed to reduce travel needs, particularly oriented around travel to and from employment. Some potential strategies that employers might implement include: expand and promote use of existing voluntary commute trip reduction programs, require end of trip facilities, promote telecommuting by county residents, and expand ride-share programs for county employees. It was assumed that no more than 50 percent of all potential private employers would implement these strategies. Empirical studies have shown that these TDM programs can have a maximum effectiveness of 6 percent in terms of commute activity VMT, based on the studies of various sites where these voluntary programs are implementation. One major limitation is that these TDM reductions only apply to trips at the employment end and therefore we need to discount the reduction in countywide VMT based on the percentage contribution that employee trips make to overall countywide travel. Our estimates of employee travel indicate that only half of the County's VMT is attributable to employee travel. As a result, the potential effectiveness of this strategy has been reduced by 50 percent to 3 percent as a maximum potential effectiveness. Based on conservative participation rates in TDM programs the effectiveness of this strategy is further reduced to approximately 2%. In addition, the effectiveness of a program oriented toward County residents to encourage their participation in the iCommute Program, Telecommuting, and other TDM strategies was considered. This strategy was determined to have an effectiveness of 1%; since it is unlikely residents would be able to make major changes in their work related travel behavior without concurrence of their employers.

Participation Rate (percentage of employers using TDM)	Efficiency (% VMT reductions)	GHG Reduction (MT CO ₂ e/year)	Scaled Measure Performance (% reduction in GHG emissions)
50%	3%	93,135	6.2%
<p>Sources: Pratt, Dick. Personal Communication Regarding the Draft of TCRP 95 Traveler Response to Transportation System Changes – Chapter 19 Employer and Institutional TDM Strategies.</p> <p>Herzog, Erik, Stacey Bricka, Lucie Audette, and Jeffra Rockwell. 2006. "Do Employee Commuter Benefits Reduce Vehicle Emissions and Fuel Consumption? Results of Fall 2004 Survey of Best Workplaces for Commuters." <i>Transportation Research Record</i> 1956, 34-41. (Table 8)</p> <p>Transportation Demand Management Institute of the Association for CommuterTransportation. <i>TDM Case Studies and Commuter Testimonials</i>. Prepared for the US EPA. 1997. (p. 25-28) http://www.epa.gov/OMS/stateresources/rellinks/docs/tdmcases.pdf</p> <p>Pucher J., Dill, J., and Handy, S. <i>Infrastructure, Programs and Policies to Increase Bicycling: An International Review</i>. February 2010. (Table 2, pg. S111) http://policy.rutgers.edu/faculty/pucher/Pucher_Dill_Handy10.pdf</p> <p>Victoria Transportation Policy Institute (VTPI). <i>TDM Encyclopedia</i>, http://www.vtpi.org/tdm/tdm9.htm; accessed 3/4/2010; last update 1/25/2010). VTPI citing: Reid Ewing (1993), "TDM, Growth Management, and the Other Four Out of Five Trips," <i>Transportation Quarterly</i>, Vol. 47, No. 3, Summer 1993, pp. 343-366.</p> <p>Center for Clean Air Policy (CCAP), <i>CCAP Transportation Emission Guidebook</i>. http://www.ccap.org/safe/guidebook/guide_complete.html; TIAX Results of 2005 Literature Search Conducted by TIAX on behalf of SMAQMD</p>			

T4 - Electric Vehicles

Decrease emission associated with VMT by increasing the number of clean fuel vehicles, such as electric vehicles.

Some level of Electric Vehicle (EV) adoption is already assumed in the analysis of other GHG reduction measures and would occur through the implementation of Pavley Fuel Efficiency Standards. This strategy is geared towards increasing the purchase and use of EVs beyond what would be expected through existing policies. To quantify emission reductions from this measure it was assumed that there would be an increase of 15% in the population of county residents purchasing Electric Vehicles. The CAPCOA Quantification Report indicates that the usage of an electric vehicle as compared to a traditional gasoline powered vehicle reduces emissions on a per VMT basis by approximately 20 percent. This reduction occurs as the GHG emissions associated with a gasoline vehicle are replaced by an electric car, which must obtain its electricity from traditional power sources, resulting in GHG emissions. The need to produce electricity from alternative sources is one reason why the GHG reductions are 20 percent instead of 100 percent.

Participation Rate (% increase in electric vehicle purchase)	Efficiency (% VMT reductions)	GHG Reduction (MT CO ₂ e/year)	Scaled Measure Performance (% reduction in GHG emissions)
15%	3%	93,135	6.2%
Sources: California Air Resources Board. EMFAC2007. Available online at: http://www.arb.ca.gov/msei/onroad/latest_version.htm US Department of Energy. 2010. Alternative and Advanced Fuels – Fuel Properties. Available online at: http://www.afdc.energy.gov/afdc/fuels/properties.html			

Agriculture

A1 - Nitrogen Optimization

Decrease the nitrogen fertilizer applied by 5% of County farmers by 20%

This measure assumes 5% of farmers in the county will utilize new methods and reduce nitrogen fertilizer usage by 20%.

Participation Rate	Efficiency (% less fertilizer applied on crops)	GHG Reduction (MT CO ₂ e/year)	Scaled Measure Performance (% reduction in GHG emissions)
5%	20%	199	0.0%
Sources: http://coststudies.ucdavis.edu/current.php			

A2 - Field Equipment Fuel Efficiency

Increase the efficiency of 35% of the farm equipment used in the county by 15%

This measure assumes that through better maintenance and other best practices farmers in the County can increase the efficiency of 35% of the total farm equipment operated by 15%.

Participation Rate	Efficiency (% less energy used in farm equipment)	GHG Reduction (MT CO ₂ e/year)	Scaled Measure Performance (% reduction in GHG emissions)
35%	15%	4,433	0.3%
Sources: AECOM 2011.			

A3 - Agriculture Irrigation Pump Efficiency

Increase the efficiency of 40% of the irrigation pumps in the county by 50%

This measure assumes that by utilizing newer technology and consistent maintenance, 40% of the agriculture irrigation pumps in the county will be able to increase efficiency by 50%.

Participation Rate	Efficiency (% less energy used)	GHG Reduction (MT CO ₂ e/year)	Scaled Measure Performance (% reduction in GHG emissions)
40%	50%	1,826	0.1%
Sources: California Agricultural Water Electrical Energy Requirements Final Report. December 2003. ITRC Report No. R 03-006.			

State and Federal

SF1 - Pavley I & II - Passenger Auto and Light Truck Fuel Efficiency

AB 1493, California's mobile-source GHG emissions regulations for passenger vehicles, was signed into law in 2002. The GHG reductions associated with AB 1493 that would affect the County in 2020 were calculated using ARB's *Pavley I + Low Carbon Fuel Standard Postprocessor* Version 1.0 (ARB 2010). This model applies an approximate 13.7% reduction to on-road mobile-source GHG emissions for AB 1493 in 2020 in the County (ARB 2010). Because ARB has not released a model for the Pavley II, which will regulate GHG emissions from Model Year 2017 -2025 vehicles, the emission reductions from Pavley II were estimated assuming that the fleet wide goal of reaching an average MPG of 35 would be achieved and that emission reductions would be similar to the emission reductions that occurred from the enactment of Pavley I.

Participation Rate	Efficiency (% increase in MPG)	GHG Reduction (MT CO ₂ e/year)	Scaled Measure Performance (% reduction in GHG emissions)
100%	13.7%	416,210	28.4%
Sources: <i>Pavley I + Low Carbon Fuel Standard Postprocessor</i> Version 1.0 and AECOM 2012.			

SF2 - Low Carbon Fuel Standard

The Low Carbon Fuel Standard (LCFS) was designed to accelerate the availability and diversity of low-carbon fuels and reduce the carbon intensity of fuels used within California. The ARB's *Pavley I + Low Carbon Fuel Standard Postprocessor* Version 1.0 was used to quantify the GHG reductions from LCFS that would apply to the County in 2020. This model applies an approximate 6.5% reduction to on-road mobile-source GHG emissions for LCFS in 2020 in the County (ARB 2010).

Participation Rate	Efficiency (% decrease in carbon intensity of transportation fuels)	GHG Reduction (MT CO ₂ e/year)	Scaled Measure Performance (% reduction in GHG emissions)
100%	6.5%	175,075	12.0%
Sources: <i>Pavley I + Low Carbon Fuel Standard Postprocessor</i> Version 1.0			

SF3 - Renewable Portfolio Standard

Established in 2002 under Senate Bill 1078 and accelerated in 2006 under Senate Bill 107, California has set a Renewable Portfolio Standard (RPS) goal for investor-owned utilities to procure 20% of electricity from eligible renewable energy resources by 2010. This goal increased to 33% by Executive Order (EO) S-21-09, signed in 2009. The GHG reductions in this measure are based on the 2005 SDG&E RPS of 5.2% and the assumption that SDG&E will achieve the mandated RPS of 33% by 2020.

Participation Rate	Efficiency (% increase in RPS)	GHG Reduction (MT CO ₂ e/year)	Scaled Measure Performance (% reduction in GHG emissions)
100%	33%	200,665	13.7%
Sources: www.cpuc.ca.gov/PUC/energy/Renewables/			

SF4 - Tire Pressure Program

The California Air Resources Board's (CARB) Tire Pressure Regulation took effect in September of 2010. For this measure, it was assumed that vehicles operating with under inflated tires would be inflated to the recommended tire pressure rating any time they are taken in for maintenance or repair service. The

efficiency of passenger vehicles was determined based on the Scoping Plan estimated reductions scaled to the County.

Participation Rate	Efficiency (% decrease in fuel usage)	GHG Reduction (MT CO ₂ e/year)	Scaled Measure Performance (% reduction in GHG emissions)
100%	0.6%	8,482	0.6%
Sources: www.arb.ca.gov/cc/tire-pressure/tire-pressure.htm			

SF5 - Heavy Duty Vehicle GHG Emission Reduction Measure – Aerodynamic

In December of 2008, the California Air Resources Board (CARB) adopted a new regulation to reduce greenhouse gas emissions by improving the fuel efficiency of heavy-duty tractors that pull 53-foot or longer box-type trailers. To measure the emissions reductions from this measure it was assumed that all required vehicles are retrofitted to include fuel savings improvements in tractor and trailer aerodynamics and in the use of low rolling resistance tires. Efficiency was determined by ARB at the time of rulemaking for statewide reductions and scaled to the County.

Participation Rate	Efficiency (% decrease in fuel usage)	GHG Reduction (MT CO ₂ e/year)	Scaled Measure Performance (% reduction in GHG emissions)
100%	1.7%	9,753	0.7%
Sources: http://www.arb.ca.gov/cc/hdghg/hdghg.htm			

APPENDIX D: ALTERNATIVE 2035 SCENARIO

As stated in the Climate Action Plan (CAP), Executive Order S-3-05 asserts that California should reduce greenhouse gas (GHG) emissions to 80% below 1990 levels by 2050 to adequately address climate change impacts. To assure the County continues along the path toward this long-range target, the County would need to reduce emissions 49% below 2005 levels by 2035. With current legislation, existing technology, and other factors, the County has developed a *feasible* scenario for 2035, which achieves 13.7% reductions below 2005 levels.

The County developed an alternative scenario to determine how the 2035 target could be met. This could only be done through additional state/federal and local measures, many of which are ambitious given existing conditions. For example, at the local level, the County would need to implement retrofits of all existing residential units built before 2005 and achieve an average 35% increased efficiency. At the state/federal level, additional transportation-related legislation could be implemented to achieve an average fuel efficiency among all model years of 44 miles per gallon (as opposed to the currently proposed CAFE standards that would require model year 2025 vehicles to achieve an average of 49 miles per gallon), and a renewable portfolio standard of 50%. This scenario is only one of many that could be implemented to achieve the 2035 target. This illustrates the level of commitment needed at all levels of government and that the CAP, its measures, and performance targets, will need to be revised as additional technological advances and legislation occur.

The table on the following page details the measures, reduction potential, and assumptions that were included to meet the 2035 Target Scenario. As described in the CAP, this scenario assumes a similar proportion of reductions achieved through state/federal measures in 2035 as are achieved in 2020. Additional local measures are included in the Target Scenario, below, that are not included in the CAP, such as wastewater to energy (biogas) and solid waste diversion beyond the County's current diversion rate.

Table D.1 | 2035 Scenario Achieving Target

		2035 Reductions	Assumptions	Scaled Measure Performance (% reduction in GHG emissions)
CAP Measure #	Measure	MT CO ₂ e/Yr		
Water				
W1	Per Capita Water Reduction (SB 7X)	44,753	40% per capita water reduction	1.1%
	Wastewater (WW) to Energy	2,586	66,454 MT CO ₂ e WW, 25% plant efficiency	0.1%
	Increased Solid Waste (SW) Diversion	114,575	60% diversion above current rates (~84% total SW diversion)	2.8%
Energy				
E2.1	Residential Building Retrofits	176,867	100% pre-2005 units achieve 35% increased efficiency (elec + ng)	4.4%
E2.2	Commercial Building Retrofits	240,901	Whole-building retrofits achieve 25% increased efficiency (elec + ng)	5.9%
E3	Appliance Upgrade	57,197	100% pre-2005 residential units	1.4%
E4	Smart Meters	9,963	100% pre-2005 units	0.2%
R1	Solar Water Heating (Res and Comm)	196,635	100% participation	4.8%
R2	Alternative Energy Systems (Res and Comm)	130,575	10% residential elec from renewables; 200 MW commercial solar generation	3.2%
Land Use				
LU1	Mixed-Use Development	160,199	Achieve 20% VMT Reduction from 2035 BAU through LU/T measures	3.9%
Transportation				
T1	Increase Biking and Walking	160,199		3.9%
T2	Increase Ride Sharing	160,199		3.9%
T3	Increase Transit Use	160,199		3.9%
T4	Electric Vehicles	160,199		3.9%
Agriculture				
A1	Nitrogen Optimization Program	3,531	100% participation	0.1%
A2	Field Equipment Fuel Efficiency Program	11,212	100% participation	0.3%
A3	Agriculture Irrigation Pump Efficiency	4,040	100% participation	0.1%
Landscaping and Open Space				
LS1	Plant Trees	2,475	Plant 10,000 trees 2020-2035	0.1%
TOTAL COUNTY ACTION		1,796,305		44.3%
State and Federal				
SF1	Passenger Auto and Light Truck Fuel Efficiency	1,487,373	Average Passenger/Lt Truck Vehicle Fuel Efficiency of 44 mpg	36.7%
SF2	Diesel)	366,242	40% carbon reduction in fuels	9.0%
SF3	Renewable Portfolio Standard	180,465	50% renewables in electricity	4.4%
SF4	Tire Pressure Program	5,192	No change from current standards	0.1%
SF5	HDV GHG Emission Reduction Measure – Aerodynamic	39,826	Increase MDV/HDV efficiency 10% beyond 2020 standards	1.0%
	Title 24 Standards	181,701	Net zero 2020-2035 res/comm energy standards	4.5%
TOTAL STATE AND FEDERAL ACTION		2,260,799		55.7%
TOTAL REDUCTIONS (COUNTY, STATE, AND FEDERAL ACTIONS)		4,057,104		100%
Percent Reduction below 2005 Baseline				49.1%

Figure D.1 | 2035 Target Scenario by Emission Reduction Measure

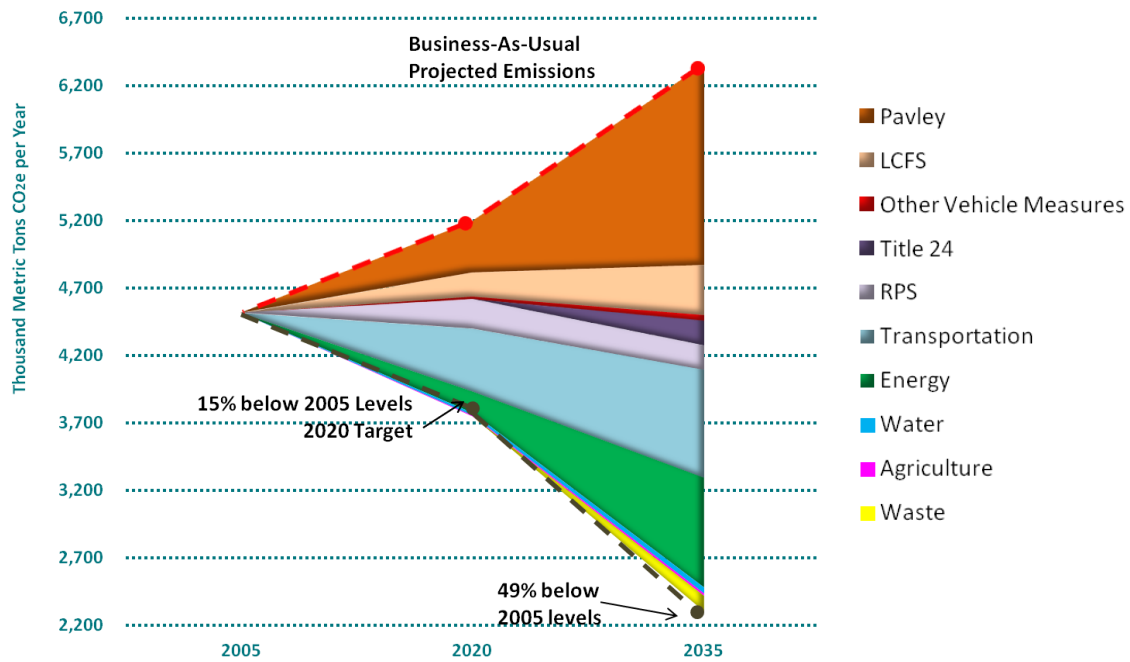


Figure D.2 | 2035 Target Scenario by Emission Reduction Sector

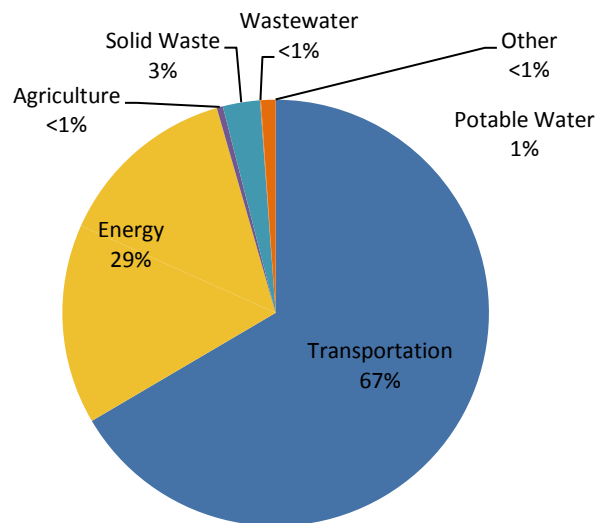
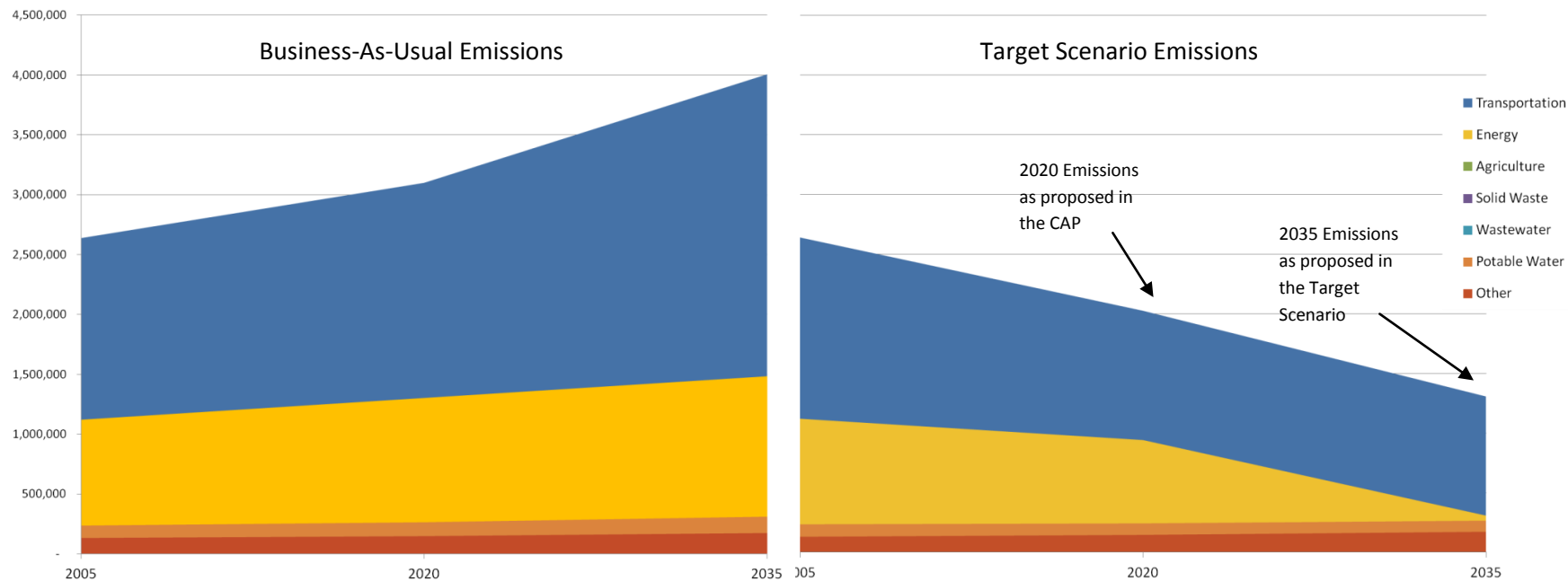


Figure D.3 | BAU and Target Scenario Emissions by Sector



APPENDIX E: LEGISLATIVE DETAIL

This appendix provides additional detail regarding the legislative requirements related to greenhouse gas (GHG) reductions in California.

State Legislation

California has adopted a wide variety of regulations aimed at reducing state GHG emissions. While state actions alone cannot stop global warming, the adoption and implementation of this legislation demonstrates California's leadership in addressing this challenge.

Executive Order S-3-05

Executive Order S-3-05 states that California is vulnerable to the effects of climate change, including reduced snowpack in the Sierra Nevada, exacerbation of California's existing air quality problems, and sea level rise. To address these concerns, the executive order established statewide targets to reduce GHG emissions to 2000 levels by 2010, to 1990 levels by 2020, and to 80% below 1990 levels by 2050.

Assembly Bill 32 and Climate Change Scoping Plan

AB 32, the California Global Warming Solutions Act of 2006, requires California to reduce statewide GHG emissions to 1990 levels by 2020. AB 32 directs ARB to develop and implement regulations that reduce statewide GHG emissions. The Climate Change Scoping Plan (Scoping Plan) was approved by ARB in December 2008 and outlines California's plan to achieve the GHG reductions required in AB 32. The Scoping Plan contains the primary strategies California will implement to achieve a reduction of 169 million metric tons of carbon dioxide equivalent, or approximately 28% from state projected 2020 emission levels.

In the Scoping Plan, ARB encourages local governments to adopt a reduction goal for municipal operations emissions and to move toward establishing similar goals for community emissions that parallel the State of California's commitment to reduce GHGs. The Plan identifies California's cities and counties as "essential partners" within the overall statewide effort and recommends that local governments set a GHG reduction target of 15 percent below 2005–2008 levels by the year 2020. Though the specific role local governments will play in meeting California's GHG reduction goals is still being defined, they will nonetheless be key players.

Senate Bill 375

Additionally, SB 375 (2008) established a process whereby regional targets for reduced passenger vehicle and light duty truck GHG emissions have been established for each Metropolitan Planning Organization (MPO) in the state, including SANDAG. ARB's adopted targets for the SANDAG region include a 7% per capita reduction by 2020 and a 13% per capita reduction by 2035. It should be noted that this is a regional target and not necessarily a target for each member jurisdiction.

Senate Bill 97

SB 97 acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. Pursuant to SB 97, the State CEQA Guidelines were updated in 2010 to include provisions for mitigating GHG emissions and/or the effects of GHG emissions. The amended CEQA Guidelines (Section 15183.5) allow jurisdictions to analyze and mitigate the significant effects of GHGs at a programmatic

level by adopting a plan for the reduction of GHG emissions. Later, as individual projects are proposed, project-specific environmental documents may tier from and/or incorporate by reference that existing programmatic review in their cumulative impacts analysis. If a plan is to be used for tiering or incorporation by reference purposes, it should contain enforceable reduction measures and demonstrate that it can reliably reduce the community's GHG emissions to a degree that contributes its fair share to state emissions reduction efforts.

Attorney General Guidance

In March 2009 correspondence to local governments completing General Plan updates, the State Attorney General's Office emphasized and expanded upon this recommendation by stating that community-wide targets should align with an emissions trajectory that reflects aggressive GHG mitigation in the near term, and California's interim (1990 levels by 2020) and long-term (80% below 1990 levels by 2050) GHG emissions limits set forth in AB 32 and Executive Order S-3-05.

The Attorney General's August 31, 2009, letter to the County of San Diego states that GHG projections associated with a General Plan update should estimate the emission levels through the full planning horizon, not just in 2020. Though the letter only explicitly calls for 2030 projections, it could be assumed that an emissions reduction target for 2030 would also be required.

AB 1493

AB 1493, California's mobile-source GHG emissions regulations for passenger vehicles, was signed into law in 2002. AB 1493 requires ARB to develop and adopt regulations that reduce GHG emissions from passenger vehicles, light-duty trucks, and other non-commercial vehicles for personal transportation. In 2004, ARB approved amendments to the California Code of Regulations adding GHG emissions standards to California's existing standards for motor vehicle emissions.

EO-S-1-07 – The Low Carbon Fuel Standard

EO-S-01-07 reduces the carbon intensity of California's transportation fuels by at least 10% by 2020. The Low Carbon Fuel Standard (LCFS) is a performance standard with flexible compliance mechanisms that incentivizes the development of a diverse set of clean, low-carbon transportation fuel options to reduce GHG emissions.

Renewable Portfolio Standard

SB 1078, SB 107, EO-S-14-08, and SB X1-2 have established increasingly stringent Renewable Portfolio Standard (RPS) requirements for California utilities. RPS-eligible energy sources include wind, solar, geothermal, biomass, and small-scale hydro.

- SB 1078 required investor-owned utilities to provide at least 20% of their electricity from renewable resources by 2020.
- SB 107 accelerated the SB 1078 timeframe to take effect in 2010.
- EO-S-14-08 increased the RPS further to 33% by 2020. SDG&E, the County's electricity provider, delivered 5.2% of its electricity from renewable sources in 2005.
- SB X1-2 codified the 33% RPS by 2020 requirement established by EO-S-14-08.

- SB X1-2 codified the 33% RPS by 2020 requirement established by EO-S-14-08.

SB 7X 7

SB 7x 7 requires the state to achieve a 20% reduction in urban per capita water use by December 31, 2020. The state is required to make incremental progress toward this goal by reducing per capita water use by at least 10% on or before December 31, 2015. SB 7X 7 requires each urban retail water supplier to develop both long-term urban water use targets and an interim urban water use target. SB 7X 7 also creates a framework for future planning and actions for urban and agricultural users to reduce per capita water consumption 20% by 2020.

Vehicle Efficiency Measures

Vehicle efficiency reductions in the CAP were calculated based on the following two regulations.

- **Tire Pressure Program** – Ensuring proper tire inflation would reduce tailpipe GHG emissions by reducing tire rolling resistance and increasing vehicle efficiency. ARB identified the tire inflation measure as a Discrete Early Action in 2007, which means a regulation to implement the measure must be enforceable starting in 2010. The tire inflation and tire program would affect vehicle service facilities such as dealerships, maintenance garages, oil change facilities, tire centers, and smog check facilities.
- **Medium/Heavy Duty Vehicle Efficiency** – Heavy-Duty Vehicle GHG Emission Reduction (Aerodynamic Efficiency) regulations require existing trucks/trailers to be retrofitted with the best available technology and/or ARB-approved technology. This measure has been identified as a Discrete Early Action in the Scoping Plan, which means it must be enforceable beginning in 2010. Technologies that reduce GHG emissions and improve the fuel efficiency of trucks may include devices that reduce aerodynamic drag and rolling resistance. These requirements apply to both California-registered trucks and out-of-state registered trucks that travel to California.

APPENDIX F: ACRONYM LIST

This appendix lists the acronyms that are used in the CAP.

%	percent
°F	degrees Fahrenheit
AB	Assembly Bill
ARB	California Air Resources Board
ARRA	American Recovery and Reinvestment Act
BAU	business as usual
Caltrans	California Department of Transportation
CAP	Climate Action Plan
CCSE	California Center for Sustainable Energy
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CO ₂	carbon dioxide
CO ₂ e	CO ₂ equivalent
County	County of San Diego
CREBS	Clean Renewable Energy Bonds
CSI	California Solar Initiative
DEER	Database for Energy Efficiency Resources
DPW	Department of Public Works
EECBG	Energy Efficiency and Conservation Block Grants
EIR	Environmental Impact Report
EMS	Energy Management System
EO	Executive Order
ESP	Energy Service Provider
GHG	greenhouse gas
GHGRP	Greenhouse Gas Reduction Plan
GWP	global warming potential
HVAC	heating, ventilation, and air conditioning
IPCC	International Panel on Climate Change
LCFS	Low Carbon Fuel Standard
LEED	Leadership in Energy and Environmental Design
MMT	million metric tons
MT	metric tons
MTS	Metropolitan Transit System
MW	megawatt
PPA	Power Purchase Agreement
ppm	parts per million
PV	photovoltaic
QECB	Qualified Energy Conservation Bond
RPS	Renewable Portfolio Standard
SANDAG	San Diego Association of Governments
SB	Senate Bill
SDG&E	San Diego Gas and Electric
SEP	Strategic Energy Plan
USEPA	U.S. Environmental Protection Agency
VMT	vehicle miles traveled

APPENDIX G: PHOTO SOURCES

Below is a list of the images in the CAP that were taken at the various locations throughout the County and other stock images that were used.

Images from San Diego County

Bike path and bus stop in Valley Center, Valley Center, CA 92082, by AECOM Staff – Pages 38, 40, 41, 48

Fallbrook Community Garden, Alturas Road and Ali Lane, Fallbrook, CA, 92028, by AECOM Staff – Cover Page

Fallbrook Public Library, 113 South Main Avenue, Fallbrook, CA 92028, – Pages 28, 32, 39

Fallbrook Public Utility District, 990 East Mission Road, Fallbrook, CA, by AECOM Staff – Pages 42, 53

Highway S13 and Winterhaven Road, Fallbrook, CA 92028, by AECOM Staff – Page 27

Keys Creek Lavender Farm, 12460 Keys Creek Road, Valley Center, CA 92082, by AECOM Staff – Pages 1, 45, 77

Morning Star Ranch, 12458 Keys Creek Road, Valley Center, CA 92082, by AECOM Staff – Pages 2, 13, 26, 30, 44, 47, 59, 67, 75

Twin Oaks Valley Water Treatment Plant, 3566 North Twin Oaks Valley Road, San Marcos, CA 92069, by AECOM Staff – Pages 9, 21

Valley Center Water District Solar Installation, Valley Center, CA 92082, by AECOM Staff – Page 35

Stock Images

From www.shutterstock.com:

Page 29 – ID# 88948309,

Page 33 – ID# 87941197

Page 43 – ID# 62555080

Page 46 – ID# 56183440

Page 63 – ID#32691

From Other Sources:

Page 34 – SDG&E via: <http://www.earthtechling.com/2011/07/smart-meter-privacy-rules-adopted-by-calif/>, Accessed: August 19, 2011

APPENDIX H:

County of San Diego CAP Compliance Checklist for Greenhouse Gas Analysis

PROJECT INFORMATION

Date: _____

Project Number: _____

Project Name: _____

Project Applicant: _____

GHG Specialist: _____

Project Owner: _____

Does this project meet the screening criteria listed in Table 3 of the County of San Diego's Guidelines for Determining Significance for Climate Change, or has the project demonstrated that it is below the Bright Line Threshold, as described in the Guidelines for Determining Significance?

☐ Yes ☐ No

If Yes, project must complete the following checklist and comply with one or more (or equivalent combination¹) of the applicable CAP measures beyond any applicable County standards. Specify the measure(s) below.

If No, project must complete the following checklist and should comply with applicable measures listed for the relevant project type below. The project proponent must conduct a technical analysis to demonstrate that the project's design features, along with Climate Action Plan (CAP) measures and, if necessary, additional measures, are incorporated that would reduce emissions below the Bright Line Threshold, the Efficiency Threshold, or the Performance Threshold. The Applicability Table may be used as guidance for CAP measures, but any GHG-reducing measures may be included that achieve the Bright Line, Efficiency, or Performance Threshold.

¹ A project must demonstrate compliance with a single CAP measure beyond any applicable County standards and requirements. If the project demonstrates ½ of one CAP measure and ½ of another CAP measure, or similar compliance with multiple CAP measures, the project may be determined to be equivalent to complying with 1 full measure. In these instances, the measure(s) will be subject to approval by the project reviewer.

General Guidance for Use in Determining Applicability of CAP Measures for Projects Under the Bright Line Threshold¹

Project Type	CAP Measures														
	E1: Energy efficiency for new development	E2: Building energy retrofits	E3: Energy Star Appliances	E4: Smart meters	R1: Solar water heating	R2: Alternative energy systems	LU1: Mixed use development	T1:Increase transit use	T2: Increase walking and biking	T3: Increase ridesharing	T4: Alternative fuel vehicles	LS1:Tree planting	A1: Nitrogen optimization	A2: Field equipment fuel efficiency	A3: Agricultural irrigation pump efficiency
New Residential	●		●		●	●									
New Commercial	●				●	●									
Industrial	●				●	●									
Mixed-Use	●		●		●	●									
Agriculture + Residential	● ²	● ²	●		●	●									
Other ³	●	●	●		●	●									

¹ The determination of applicability will be made by DPLU with the project applicant at the time of scoping/review; however, for most projects under the Bright Line Threshold, unchecked measures (e.g., as LU1, T1-4) will not result in measurable GHG emission reductions and therefore will likely be not applicable at the project level.

² Depending on whether residential is new or existing, this measure may not apply.

³ For other project types, project reviewer will determine which measures are applicable to the project.

CHECKLIST

Instructions: All projects must complete this checklist for the relevant project type and fill in “Details of Compliance”. For projects below the Bright Line Threshold, a description of how the project would achieve conformance with the CAP measure is provided in “Description”; for projects above the Bright Line Threshold, the applicant may comply with each measure at any performance level but must demonstrate achievement of the Bright Line Threshold, Efficiency Threshold, or Performance Threshold.

Type of Project _____ Project Number _____

CAP #	Measure	Description ²	Details of Compliance	% Reduction (for Projects Exceeding the Bright Line)	Percentage of Measure Compliance (for Projects under the Bright Line)
E1	Energy Efficiency for New Development	10% of square footage (comm./ind.) or 10% of units (res.) exceeds Title 24 (2008) standards by 15% for projects scoped through 12/31/2014; 100% of sf/units exceeding Title 24 (2008) standards by 15% for projects scoped after 12/31/2014	Number of units Exceeding Title 24 _____		
E2	Building Energy Retrofits (only for existing structures)	RESIDENTIAL: Achieve overall (across all units) 5% energy efficiency ³ COMMERCIAL: Achieve 12% overall lighting efficiency ⁴	Efficiency achieved and type of retrofits _____		

² Description details compliance with the CAP measure. Projects must meet an equivalent of one CAP measure as described here; for projects over the Bright Line, any level of compliance is acceptable that results in meeting the Threshold and applicant must provide substantial evidence to support reduction.

³ CAP measure includes 15% participation among existing buildings achieving 35% efficiency. At the project level, this translates to (0.15×0.35) approximately a 5% overall efficiency goal.

CAP #	Measure	Description ²	Details of Compliance	% Reduction (for Projects Exceeding the Bright Line)	Percentage of Measure Compliance (for Projects under the Bright Line)
E3	Appliance Upgrades	Energy Star appliances in 95% of new residential units; 40% of existing residential units. Appliances include light bulbs, clothes washers, dishwashers, and refrigerators)	Number of Energy Star Appliances _____		
E4	Smart Meters	Detail to be provided by applicant	Number of residences joining online program _____		
R1	Solar Water Heating	19% of overall water heating needs derived from solar	Number of units with solar water heaters _____		
R2	Alternative Energy Systems	30% of residential electricity / 20% commercial electricity generated from alternative energy systems	KW of solar panels installed _____		
LU1	Mixed-Use Development	Detail to be provided by applicant			

⁴ CAP measure includes 30% participation among existing buildings achieving 40% efficiency. At the project level, this translates to (0.30 x 0.40) a 12% overall efficiency goal.

CAP #	Measure	Description ²	Details of Compliance	% Reduction (for Projects Exceeding the Bright Line)	Percentage of Measure Compliance (for Projects under the Bright Line)
T1	Increase Transit Use	Detail to be provided by applicant			
T2	Increase Walking and Biking	Detail to be provided by applicant	Additional feet of sidewalk installed _____		
T3	Increase Ridesharing	Detail to be provided by applicant			
T4	Alternative-Fuel Vehicles	Detail to be provided by applicant			
LS1	Tree Planting	Detail to be provided by applicant	New trees and types planted _____		
A1	Nitrogen Optimization	Detail to be provided by applicant			
A2	Field Equipment Fuel Efficiency	Detail to be provided by applicant			
A3	Agriculture Irrigation Pump Efficiency	Detail to be provided by applicant			

Other Measures, not described in the CAP, that would achieve GHG reductions in the proposed project (for Projects over the Bright Line) This includes reductions taken for Statewide regulations ⁵ .					
	Measure	Description	Details of Compliance	% Reduction	

Total Reduction % (for Projects Exceeding the Bright Line Threshold) Must equal 16% or more	Compliance (for Projects Under the Bright Line Threshold) Must Equal 100% or more

⁵ Refer to the County of San Diego Guidelines for Determining Significance for Climate Change for methodology in applying Statewide measures. The Performance Threshold includes 20% Renewable Portfolio Standard (RPS) and Pavley I as pre-mitigation; therefore, no additional credit may be taken for these measures by the Project. The Bright Line and Efficiency Thresholds do not include Statewide measures and therefore can be calculated for credit by the Project.